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(71) Applicant: **LG Electronics Inc.**
Seoul, 150-721 (KR)

(72) Inventors:
• **Park, Ho Joo**
Yangcheon-gu
158-723, Seoul (KR)
• **Chae, Ji Suk**
Songpa-gu
138-240, Seoul (KR)
• **Ham, Young Ho**
203-1303 Hyundai Hometown
Gyeonggi-do
448-543, Yongin City (KR)

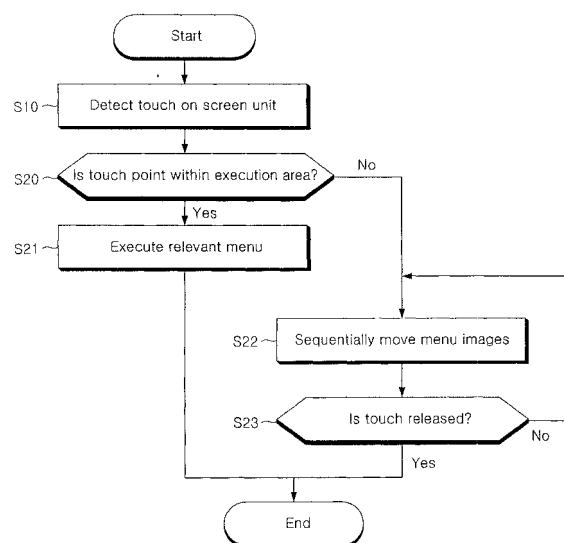
- **Yoo, Kyung Hee**
135-080, Seoul (KR)
- **Kim, Ji Ae**
135-082, Seoul (KR)
- **Kim, Yu Mi**
City, Gyeonggi-do
462-835, Seongnam City (KR)
- **Shin, Sang Hyun**
Pyeongtaek-si
Gyeonggi-do (KR)
- **Bae, Seung Jun**
Dongrae-gu
607-012, Busan City (KR)
- **Koo, Yoon Hee**
664-932, Sacheon City (KR)
- **Kang, Seong Cheol**
Gyeonggi-do
447-719, Osan City (KR)

(74) Representative: **Vossius & Partner**
Siebertstrasse 4
81675 München (DE)

(54) **Touch screen device and operating method thereof**

(57) A touch screen device and an operating method are provided in which only a specific position on a touch screen is activated to receive signals. The touch screen device includes a screen including a display configured to display menu images thereon and a detector configured to detect a screen touch, and a controller configured to control operations of the device according to the screen touch detected by the detector. The controller may cause the detector to be divided into an execution area configured to execute a menu when the menu placed on the execution area is touched, and a selection area configured to sequentially move the menu images to the execution area when the selection area is touched. Alternatively, the controller may cause the detector to be divided into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged, and an execution area configured to execute the relevant menu when the touch on the execution area is released. With a touch screen device so configured, the menus are executed only in a limited execution area.

FIG. 3



Description

[0001] A touch screen device and operating method thereof are disclosed herein.

[0002] Recently, most portable information terminals have been provided as intelligent or multi-functional terminals that can process a variety of multimedia information, such as music, games, photographs, and videos, rather than provide only a specific single function. Further, each of the portable information terminals is provided with a variety of key buttons capable of easily selecting and executing the aforementioned functions. However, since portable information terminals are small enough to be easily carried, there are difficulties in configuring a portable information terminal capable of providing all the key buttons for executing the functions.

[0003] Therefore, the latest digital portable information terminals allow a user to more conveniently input and process necessary information by employing a touch screen as a user interface. That is, since the size of a display should be maximized within a limited size thereof, the data input is generally implemented as a touch screen with which a finger or stylus pen is used.

[0004] In this way, touch screen input, which considerably increases user convenience in comparison with inputting user information through conventional key buttons, is widely employed as the user information input device and recently has been applied to most portable information terminals. Since the touch screen method allows all processes for performing specific functions to be executed on a touch screen after power is turned on, the functions of the portable information terminal can be sufficiently performed even though no input buttons are provided.

[0005] However, icons displayed on the touch screen should be selected to use the portable information terminal. At this time, it is difficult to touch a desired icon with a finger if the size of the touch screen of the portable information terminal is small. That is, this is not a problem for portable information terminals having large screens, however, there is a high probability that finger touch errors will be generated where the portable information terminals are small in size, such as MP3 players, portable multimedia players (PMPs), and personal digital assistants (PDAs). In other words, in the case of a portable information terminal having a small screen, icons are densely arranged on the screen of the portable information terminal. Therefore, it is inconvenient for a user to select and input necessary information. Further, it is contradictory to the fact that a touch screen is employed as an input means to improve the user convenience.

[0006] The present invention is specified by the claims. Embodiments will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

[0007] Fig. 1 is a block diagram of a touch screen device according to an embodiment;

[0008] Fig. 2 is a block diagram of a touch screen de-

vice according to an embodiment described in more detail;

[0009] Fig. 3 is a flowchart of a method of operating a touch screen device according to an embodiment;

5 **[0010]** Figs. 4A to 4C are exemplary views illustrating operations of a touch screen device according to an embodiment;

10 **[0011]** Fig. 5 is a flowchart illustrating a method of operating a touch screen device according to another embodiment;

[0012] Figs. 6A to 6D are exemplary views illustrating operations of a touch screen device according to an embodiment; and

15 **[0013]** Fig. 7 is an exemplary view illustrating operations of a touch screen device according to an embodiment.

20 **[0014]** Hereinafter, embodiments will be described in detail with reference to the accompanying drawings. Herein, like elements are designated by like reference numerals.

[0015] The touch screen device according to embodiments may be applied to all kinds of digital equipment to which a touch screen device is mounted, such as a MP3 player, a portable media player, a PDA, a portable terminal, a navigation system, or a notebook computer. Moreover, the touch screen device according to embodiments may be used with electronic books, newspapers, magazines, etc., different types of portable devices, for example, handsets, MP3 players, notebook computers, etc., audio applications, navigation applications, televisions, monitors, or other types of devices using a display, either monochrome or color. For convenience of explanation, an exemplary MP3 player will be described herein by way of example. Further, touch can include any type of direct or indirect touch or contact, using, for example, a finger or stylus.

35 **[0016]** Fig. 1 is a block diagram of a touch screen device according to an embodiment. As shown in Fig. 1, the touch screen device 1 may comprise a screen 10 having a function of inputting and displaying information. The screen 10 may comprise a display 20 for displaying a plurality of menu information (icons, etc.) and data thereon, and a detector 30 for detecting a touching action to select menus 50 or data displayed on the display 20. When the screen 10 is touched to select the menus 50 or data displayed on the display 20 using, for example, a finger 60 or a stylus pen, the detector 30 may detect whether the screen 10 has been touched.

40 **[0017]** The display 20 may be, for example, a liquid crystal display (LCD), a plasma display panel (PDP), a light emitting diode (LED), or an organic light emitting diode (OLED). In one embodiment, the detector unit 30 is a thin layer provided on a front surface of the display 20, which employs a resistive or capacitive method. However, alternatively, other touch screens such as touch screens that utilize infrared rays may also be employed.

45 **[0018]** In the case of a resistive touch screen, the touch screen may be configured in such a manner that two

layers coated with resistive materials are provided which are kept at a constant interval and electric currents are supplied to both the layers. If pressure is applied to a layer so that it comes into contact with another layer, an amount of electric current flowing along the layers may be changed and a touch point thus detected by the change in electric current. In contrast, in the case of a capacitive touch screen, the touch screen may be configured in such a manner that both surfaces of glass are coated with conductive metal and electric voltage is applied to edges of the glass. In such a case, high frequencies flow along the surface of the touch screen and a high frequency waveform may be distorted when a finger is touched on the surface of the touch screen, and a touch point detected by the change in the waveform.

[0019] The screen 10 may be connected to a controller 40 that controls an access command corresponding to the menu 50 selected according to the detection results of the detector 30 or data, such as additional information or messages to be described below from a storage device, and thus, the display of the command or data onto the screen 10.

[0020] The controller 40 may control not only the display 20 but may also control the overall operation of the digital equipment. Further, the controller 40 may operate the digital equipment according to the detection results of the detector 30.

[0021] According to one embodiment, the controller 40 allows the detector 30 to be divided into two portions. That is, referring to Figs. 3A-3C, the controller 40 may assign one portion of the detector 30 as an execution area 30a. The execution area 30a may be an area in which the menu 50 corresponding to a touch is executed. The other portion may be assigned as a selection area 30b. The selection area 30b may be an area in which when the touch is detected, the displayed menus 50 are sequentially moved to the execution area 30a.

[0022] That is, the controller 40 may execute a corresponding menu 50 when a touch is detected at a coordinate corresponding to the execution area 30a and move the menus 50 to the execution area 30a when a touch is detected at a coordinate corresponding to the selection area 30b. In one embodiment, the controller 40 may continuously move the menus 50 while the touch is maintained on the selection area 30b.

[0023] In Fig. 2, a touch screen device according to an embodiment is described in more detail. As shown in Fig. 2, the screen 10 may comprise a touch screen or detector 30 and a display 20. In one embodiment, a thin film transistor liquid crystal display (TFT-LCD) may be used as the display 20. The touch screen or detector 30 may be connected to a touch panel or detector controller 42 for signaling a touch detected on the touch screen or detector 30. The display 20 and the touch screen or detector controller 42 may be connected to and operated under the control of a main controller 44.

[0024] Further, a panel information storage device 45 for storing partition information of the touch screen or

detector 30 may be connected to the main controller 44. In one embodiment, the partition information stored in the panel information storage device 45 may be classified by operation mode and contains information indicative of whether a specific position on the touch screen or detector 30 is included in a selection or moving area or an execution area. Accordingly, the information on whether the respective positions are included in the execution area or the selection or moving area on the basis of coordinate axes may be stored by mode.

[0025] Furthermore, a data storage device 46 for storing, for example, MP3 files may be connected to the main controller 44. For example, a NAND memory capable of rapidly and easily storing and reading out a large amount of information may be used as the data storage device 46.

[0026] A portion of the data storage device 46 may be used as the panel information storage device 45. However, use of a separate panel information storage device 45 constructed of a NOR memory that is relatively superior in the stability of information may be advantageous.

[0027] In addition, a universal serial bus (USB) port 48 serving as an interface for modifying data may be connected to the main controller 44. The USB port 48 may be connected to an external device such that the partition information and data stored in the data storage device 46 may be updated, deleted, or modified.

[0028] Moreover, the main controller 44 may be provided with a random access memory (RAM) 47 for driving the display device, for which a synchronous dynamic RAM (SDRAM) may be used.

[0029] Hereinafter, the operation of a touch screen device according to an embodiment will be described in detail according to the execution method.

[0030] Fig. 3 is a flowchart of a method of operating a touch screen device according to an embodiment. As shown in Fig. 3, the operation of the touch screen starts from detecting a screen touch by the detector 30, in step S10.

[0031] If the detector 30 detects a touch on the screen 10, the controller 40 may determine whether the touch point is within the execution area 30a, in step S20. The execution area 30a and the selection area 30b may be set beforehand and stored. If the touch point is within the execution area 30a, the controller 40 may execute a menu 50 corresponding to the touch point, in step S21. If the touch point is within the selection area 30b, that is, the portions outside the execution area 30a, the controller 40 may sequentially move images of the menus 50 displayed on the display 10 such that the menus can be positioned within the execution area 30a, in step S22.

[0032] The controller 40 may check whether the touch is released after moving the images of the menus 50, in step S23. Then, if the touch is released, the controller 40 may terminate the operation and wait for a new touch input. However, if the touch is not released, the controller 40 may repeatedly perform the steps of sequentially moving the images of the menus 50 and then checking whether the touch has been released. The reason is that the

images of the menus 50 may be moved by a desired number of times by continuously maintaining a single touch instead of performing several touches several times when a user intends to move the images of the menus 50 several times.

[0033] Next, operation of an embodiment so configured will be explained from the viewpoint of a user.

[0034] Figs. 4A to 4C illustrating the operation of an embodiment according to input of a user.

[0035] Fig. 4A shows an example in which the execution area 30a is located at the lower center of the screen 10 and the menus 50 are arranged in the form of a circle with the center positioned at the center of the screen 10. In this state, a user determines a desired menu 50 that the user wishes to execute. For example, when the user wishes to operate an MP3 player, the user may position the "MP3" menu 50 on the execution area 30a. However, since the "GAME" menu 50 is currently positioned on the execution area 30a, the menus 50 should be moved.

[0036] Accordingly, the user touches the selection area 30b of the screen 10. Fig. 4B shows that the user touches the selection area 30b. Thus, the menus 50 rotate clockwise, and the "MP3" menu 50 is positioned on the execution area 30a. If a user wishes to record, he/she may continuously touch the selection area 30b until the "REC" menu 50 is positioned on the execution area 30a. After a desired menu 50 has been positioned on the execution area 30a, the user may merely touch the execution area 30a. When the execution area 30a is touched, the controller 40 may execute the relevant menu 50 positioned on the execution area 30a. In this example, the operation mode is changed to an "MP3" mode.

[0037] Next, the configuration, operation, and illustration of another embodiment will be described in comparison with those of the previous embodiment with reference to Figs. 5 to 6D.

[0038] First, this embodiment may have the same configuration as the previously described embodiment shown in Fig. 1. Only the functions of the controller 40 may be different.

[0039] The controller 40 according to this embodiment may allow the detector 30 to be divided into a moving area 30d and an execution area 30c. When a user touches and moves (hereinafter, referred to as 'drags') the menu 50, the moving area 30d may allow an image of the touched menu 50 to be moved along a drag line. Further, the execution area 30c may allow the relevant menu 50 to be executed when the touch is released.

[0040] Hereinafter, operation of the embodiment shown in Figs. 5 to 6D will be described with respect to the execution order.

[0041] As shown in Fig. 5, this exemplary embodiment may also be operated when the detector 30 detects a touch on the screen 10, in step S100. Then, the detector 30 may also detect a drag line along which the touch is moved. The controller 40 may cause a position of the image of the relevant menu 50 to move along the drag line. That is, the image of the menu 50 may be moved

as a touch point is changed, in step S200.

[0042] Thereafter, the detector 30 may detect whether the touch is released, in step S300. In one embodiment, the relevant menu 50 may be executed when the touch is released. The release of the touch may be detected to determine whether the relevant menu 50 will be executed.

[0043] If the touch is not released, the touching action may be considered to be maintained. Thus, the detector 30 may wait until the touch is released. Only after the touch has been released, the detector 30 may determine whether a release point is on or within the execution area 30c step S400.

[0044] If the release point is on the execution area 30c, the controller 40 may execute the relevant menu 50 and then wait for the input of the next touch signal, in step S410. However, if the release point is not on or within the execution area 30c but on the moving area 30d, the controller 40 may not execute the relevant menu 50. In addition, the controller 40 may return the relevant menu 50 to a position before the touch is made, and the controller 40 may also wait for the input of the next touch signal, in step S420. Therefore, if a user recognizes the touch of a wrong menu 50 while dragging the desired menu 50, he/she may stop dragging the relevant menu 50 within the moving area 30d to cancel the execution of the relevant menu 50 such that the relevant menu can be returned to its initial state.

[0045] Next, the operation of the embodiment so configured will be explained from the viewpoint of a user, referring to Figs. 6A to 6D.

[0046] As shown in Fig. 6A, a user who intends to execute the menu 50 first touches the menu 50 that the user wishes to select. Fig. 6A shows a case in which a user wishes to execute the "MP3" menu 50.

[0047] Then, as shown in Fig. 6B, the user may drag the relevant menu 50 from the touch point to the execution area 30c. Next, as shown in Fig. 6C, if the touch is released from the execution area 30c, the corresponding menu 50 may be executed. Further, in a case where the user does not wish to execute the menu 50 while dragging the relevant menu 50, he/she may merely release the touch from the moving area 30d.

[0048] In addition, as shown in Fig. 6C, if the other menu is dragged and placed at the execution position while an MP3 play mode is operated, the previous menu may be terminated and an icon indicative of the previous menu may be simultaneously returned to its original position. For example, as shown in Fig. 6D, if a user drags an icon representing a radio listening mode into the execution area while the MP3 play mode is operated, the icon representing the MP3 play mode may be returned to its original position and the radio listening mode executed.

[0049] Embodiments of the invention may be executed according to an operation mode. That is, in an operation mode in which a menu 50 is selected and executed, the area of the detector 30 may be divided as described

above. However, in an operation mode other than the selection of the menu 50, the entire detector 30 may be activated and used.

[0050] In the above description, the execution area is set as a fixed position. However, the execution area may be movable.

[0051] That is, as shown in Fig. 7, while the menu icons are displayed at fixed positions, the user may touch and drag the execution area onto a desired menu icon. That is, if the execution area is dragged onto the desired menu icon and the touch is then released, the menu included in the execution area may be executed. In order for the user to easily identify the execution area, the execution area may be displayed in a different color.

[0052] In a touch screen device and an operating method of a touch screen device according to embodiments as described above, at least the following advantageous effects may be expected.

[0053] That is, as described above, the probability of erroneously selecting and executing icons in a terminal device where a plurality of icons are densely arranged, due to a small screen size, may be minimized. Further, an icon operation may be performed as a user drags and moves a desired menu image. Therefore, product distinction effects may be expected due to a difference from a conventional method in which a desired icon is merely clicked to drive a relevant program. In addition, the screen touch device according to embodiments may be convenient to use since a user can cancel the execution, of a selected menu while dragging a selected menu image.

[0054] According to one embodiment broadly described herein, a touch screen device is provided which includes a screen unit including a display unit for displaying menu images thereon and a detection unit for detecting a screen touch by a user, and a control unit for controlling operations of the device according to the screen touch detected by the detection unit, wherein the detection unit is divided, by the control unit, into an execution area configured to execute a menu when the menu placed on the execution area is touched, and a selection area configured to sequentially move the menu images to the execution area when the selection area is touched. When a touch is detected on the selection area, the control unit may cause the menu images to be continuously moved while the touch on the selection area is maintained.

[0055] According to another embodiment broadly described herein, there is provided a touch screen device, which includes a screen unit including a display unit for displaying menu images thereon and a detection unit for detecting a screen touch by a user, and a control unit for controlling operations of the device according to the screen touch detected by the detection unit, wherein the detection unit is divided, by the control unit, into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged, and an execution area configured to execute the relevant menu when the touch on the execution area is released. The control unit

may return the relevant menu to an initial position before the touch, when the touch is released from the moving area. The detection unit may be a resistive or capacitive touch screen.

5 **[0056]** According to a further embodiment broadly described herein, there is provided a method of operating a touch screen device in which a detection unit for detecting a screen touch by a user is divided into an execution area configured to execute a menu when the menu placed on the execution area is touched and a selection
10 area configured to move menu images when the selection area is touched. The method includes recognizing the screen touch by the user, executing the relevant menu placed on a touch point when the touch point is within the execution area, and sequentially moving the menu images placed on the selection area to the execution area when the touch point is within the selection area. The menu images may be continuously moved while the touch on the selection area is maintained.

20 **[0057]** According to a still further embodiment, there is provided a method of operating a touch screen device in which a detection unit for detecting a screen touch by a user is divided into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged and an execution area configured to
25 execute the relevant menu when the touch on the execution area is released. The method may include recognizing the screen touch by the user, moving an image of the relevant menu along the drag line when the menu is dragged, and executing the relevant menu when the touch on the execution area is released. The method may further include returning the image of the relevant menu to an initial position before the touch, when the touch is released from the moving area.

35 **[0058]** According to a still further embodiment broadly described herein, there is provided digital equipment mounted with a touch screen device which includes a screen unit including a display unit for displaying menu images thereon and a detection unit for detecting a
40 screen touch by a user, and a control unit for controlling operations of the device according to the screen touch detected by the detection unit, wherein the detection unit is divided, by the control unit, into an execution area configured to execute a menu when the menu placed on the execution area is touched, and a selection area configured to sequentially move the menu images to the execution area when the selection area is touched.

45 **[0059]** According to a still further embodiment broadly described herein, there is provided digital equipment mounted with a touch screen device which includes a screen unit including a display unit for displaying menu images thereon and a detection unit for detecting a
50 screen touch by a user, and a control unit for controlling operations of the device according to the screen touch detected by the detection unit, wherein the detection unit is divided, by the control unit, into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged, and an execution area

configured to execute the relevant menu when the touch on the execution area is released.

[0060] Embodiments disclosed herein may prevent undesired menus from being inadvertently executed since the menus are executed only in a specific area.

[0061] According to another embodiment broadly disclosed herein, a touch screen device is provided that includes a screen including a display configured to display menu images thereon and a detector configured to detect a screen touch, and a controller configured to control operations of the touch screen device according to the screen touch detected by the detector, wherein the detector is divided by the controller into an execution area configured to execute a menu when the menu placed on the execution area is touched, and a selection area configured to sequentially move the menu images to the execution area when the selection area is touched. When a touch is detected on the selection area, the controller may cause the menu images to be continuously moved while the touch on the selection area is maintained. Further, the detector may be a resistive or capacitive touch screen. Furthermore, digital equipment may comprise the touch screen device. The digital equipment may comprise a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer.

[0062] According to another embodiment broadly disclosed herein, a touch screen device is provided that includes a screen including a display configured to display menu images thereon and a detector configured to detect a screen touch, and a controller configured to control operations of the touch screen device according to the screen touch detected by the detector, wherein the detector is divided by the controller into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged, and an execution area configured to execute the relevant menu when the touch on the execution area is released. The controller may return the relevant menu to an initial position before the touch, when the touch is released from the moving area. Further, the detector may be a resistive or capacitive touch screen. Furthermore, digital equipment may comprise the touch screen device. The digital equipment may comprise a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer.

[0063] According to another embodiment broadly disclosed herein, a touch screen device is provided that includes a touch panel configured to detect a screen touch, a touch panel controller configured to signalize the touch detected on the touch panel and control the touch panel, a display configured to display images, a panel information storage device configured to store data of the touch panel, and a main controller configured to control operation of the touch panel controller and the display. The panel information storage device may store partition information of the touch panel divided into an execution area and a selection area. The partition information may be classified by operation mode. The panel information

storage device may be a NOR flash memory.

[0064] Additionally, the device may further include a USB port connected to an external device configured to update or modify the partition information stored in the panel information storage device.

[0065] Also, the device may further comprise a data storage device configured to store data of the touch screen device, and a RAM configured to drive the touch screen device. A portion of the data storage device may be configured into the panel information storage device.

[0066] According to another embodiment broadly disclosed herein, a method of operating a touch screen device is provided in which a detector, configured to detect a screen touch is divided into an execution area configured to execute a menu when the menu placed on the execution area is touched and a selection area configured to move menu images when the selection area is touched, the method including recognizing the screen touch, executing a relevant menu placed on a touch point when the touch point is within the execution area, and sequentially moving menu images placed on the selection area to the execution area when the touch point is within the selection area. The menu images may be continuously moved while the touch on the selection area is maintained. A method of operating digital equipment having a touch screen device may comprise the method. The digital equipment may comprise a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer.

[0067] According to another embodiment broadly disclosed herein, a method of operating a touch screen device is provided in which a detector configured to detect a screen touch is divided into a moving area configured to move a menu from a touch point along a drag line while the menu is dragged and an execution area configured to execute a relevant menu when the touch on the execution area is released, the method comprising recognizing the screen touch, moving an image of the relevant menu along the drag line when the menu is dragged, and executing the relevant menu when the touch on the execution area is released. The method may further comprise returning the image of the relevant menu to an initial position before the touch, when the touch is released from the moving area. A method of operating digital equipment having a touch screen device may comprise the method. The digital equipment may comprise a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer.

[0068] Any reference in this specification to "one embodiment," "an embodiment," "example embodiment," etc., means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. The appearances of such phrases in various places in the specification are not necessarily all referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted that it is within the pur-

view of one skilled in the art to affect such feature, structure, or characteristic in connection with other ones of the embodiments.

Claims

1. A method of operating a touch screen device having a touch screen having a predetermined viewing area and a detector configured to detect a touch on the touch screen and a controller configured to control operation of the touch screen device according to the screen touch detected by the detector, wherein the touch screen is divided by the controller into a selection area having a plurality of menu images corresponding to a plurality of menus displayed thereon and an execution area configured to execute a menu when one of the plurality of menu images is placed thereon or thereunder, the method comprising:

detecting a screen touch in the selection area;
 detecting at least one of movement of a selected one of the plurality of menu images displayed in the selection area into the execution area or movement of the execution area to a selected one of the plurality of menu images displayed in the selection area;
 detecting a screen touch in the execution area;
 and
 executing a menu corresponding to the selected menu image in response to the screen touch in the execution area.

2. The method of claim 1, wherein detecting at least one of movement of a selected one of the plurality of menu images displayed in the selection area into the execution area or movement of the execution area to a selected one of the plurality of menu images displayed in the selection area comprises detecting movement of the execution area to a selected one of the plurality of menu images displayed in the selection area.
3. The method of claim 1, wherein detecting at least one of movement of a selected one of the plurality of menu images displayed in the selection area into the execution area or movement of the execution area to a selected one of the plurality of menu images displayed in the selection area comprises detecting movement of a selected one of the plurality of menu images displayed in the selection area into the execution area.
4. The method of claim 3, wherein when a selected one of the plurality of menu images displayed in the selection area is moved into the execution area, a menu image previously located in the execution area pops out of the execution area.

5. The method of claim 4, wherein when a selected one of the plurality of menu images displayed in the selection area is moved into the execution area, a menu image previously located in the execution area pops out of the execution area and returns to its original location in the selection area.

6. The method of any of claims 1 to 5, further comprising, when a screen touch is detected in the selection area, continuously moving the plurality of menu images while the touch is maintained.

7. The method of claim 6, wherein continuously moving the plurality of menu images while the touch is maintained comprises continuously moving the plurality of menu images in a clockwise or counterclockwise direction.

8. A method of operating digital equipment having a touch screen device, comprising the method of any of claims 1 to 7.

9. The method of claim 8, wherein the digital equipment comprises a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer.

10. A touch screen device, comprising:

a touch screen having a predetermined viewing area and a detector configured to detect a touch on the touch screen; and
 a controller configured to control operation of the touch screen device according to the screen touch detected by the detector, wherein the touch screen is divided by the controller into a selection area having a plurality of menu images corresponding to a plurality of menus displayed thereon and an execution area configured to execute a menu when one of the plurality of menu images is placed thereon or thereunder, wherein when a screen touch is detected in the selection area, the detector detects at least one of movement of a selected one of the plurality of menu images displayed in the selection area into the execution area or movement of the execution area to a selected one of the plurality of menu images displayed in the selection area, and thereafter if the detector detects a screen touch in the execution area, the controller executes a menu corresponding to the selected menu image in response to the screen touch in the execution area.

11. The touch screen device of claim 10, wherein when a screen touch is detected in the selection area, the detector detects movement of the execution area to a selected one of the plurality of menu images displayed in the selection area.

played in the selection area.

12. The touch screen device of claim 10, wherein when a screen touch is detected in the selection area, the detector detects movement of a selected one of the plurality of menu images displayed in the selection area into the execution area. 5
13. The method of claim 12, wherein when a selected one of the plurality of menu images displayed in the selection area is moved into the execution area, a menu image previously located in the execution area pops out of the execution area. 10
14. The method of claim 13, wherein when a selected one of the plurality of menu images displayed in the selection area is moved into the execution area, a menu image previously located in the execution area pops out of the execution area and returns to its original location in the selection area. 15
20
15. The touch screen device of claim 10, wherein when a screen touch is detected in the selection area, the controller continuously moves the plurality of menu images while the touch is maintained. 25
16. The touch screen device of claim 15, wherein when a screen touch is detected in the selection area, the controller continuously moves the plurality of menu images in a clockwise or counterclockwise direction while the touch is maintained. 30
17. The touch screen device of any of claims 10 to 16, wherein the touch screen is a resistive or capacitive touch screen. 35
18. Digital equipment comprising the touch screen device of any of claims 10 to 17.
19. The digital equipment of claim 18, wherein the digital equipment comprises a MP3 player, a portable media player, a portable terminal, a navigation system, or a notebook computer. 40
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50
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FIG. 1

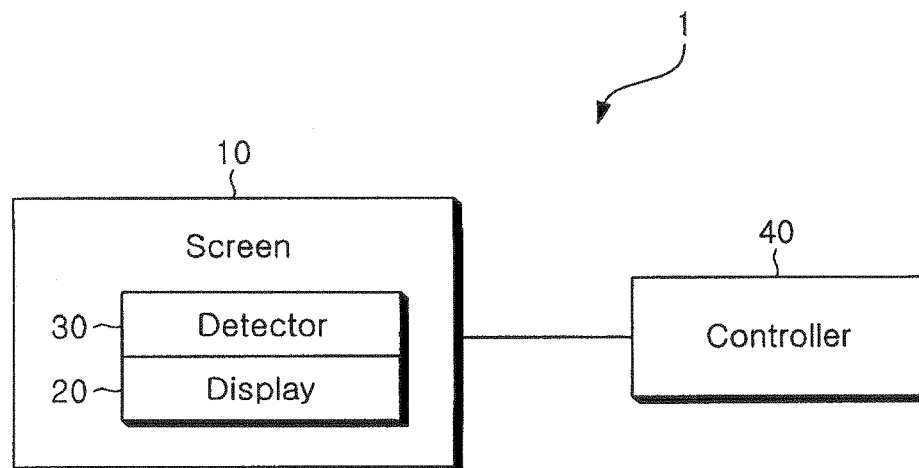


FIG. 2

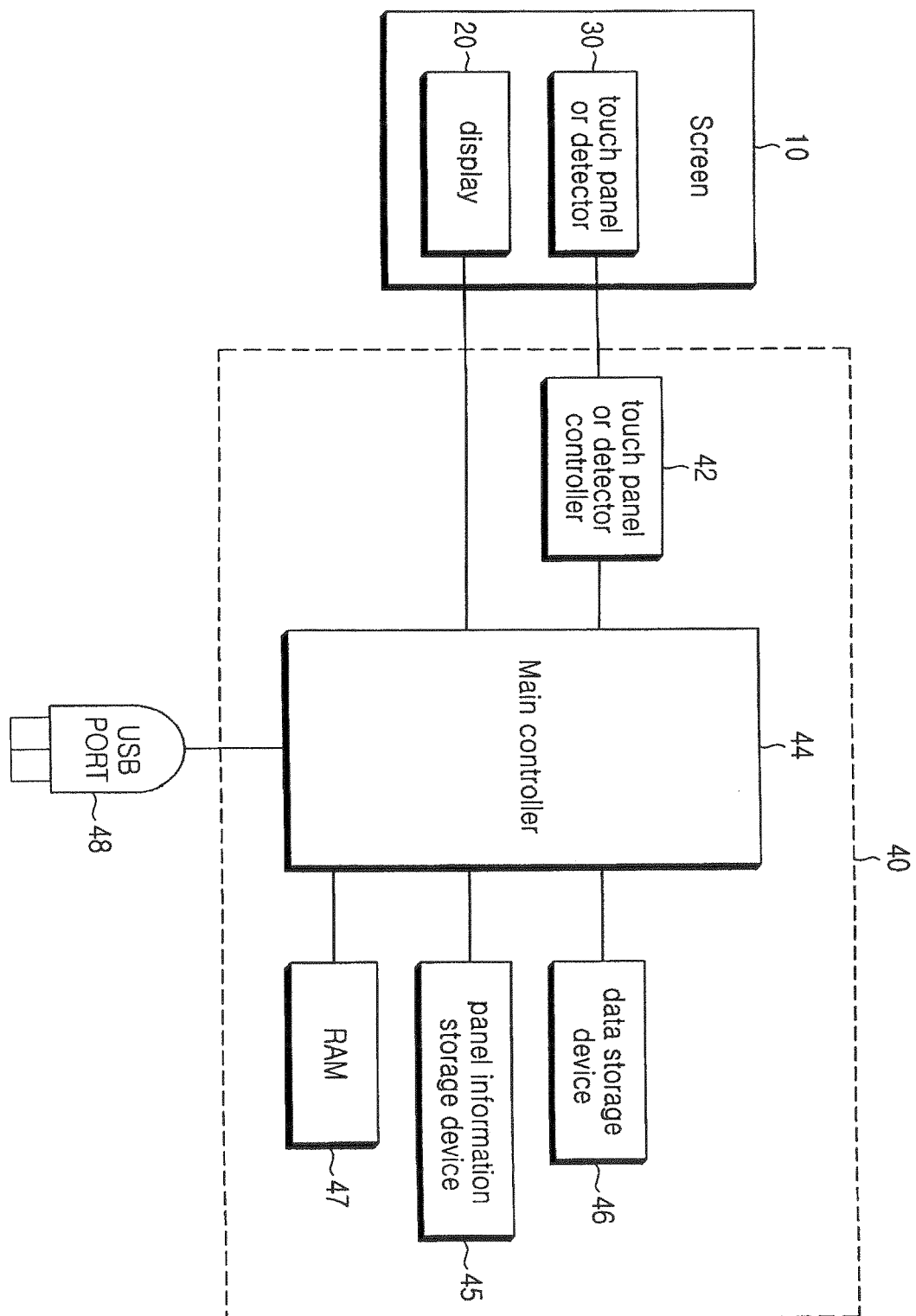


FIG. 3

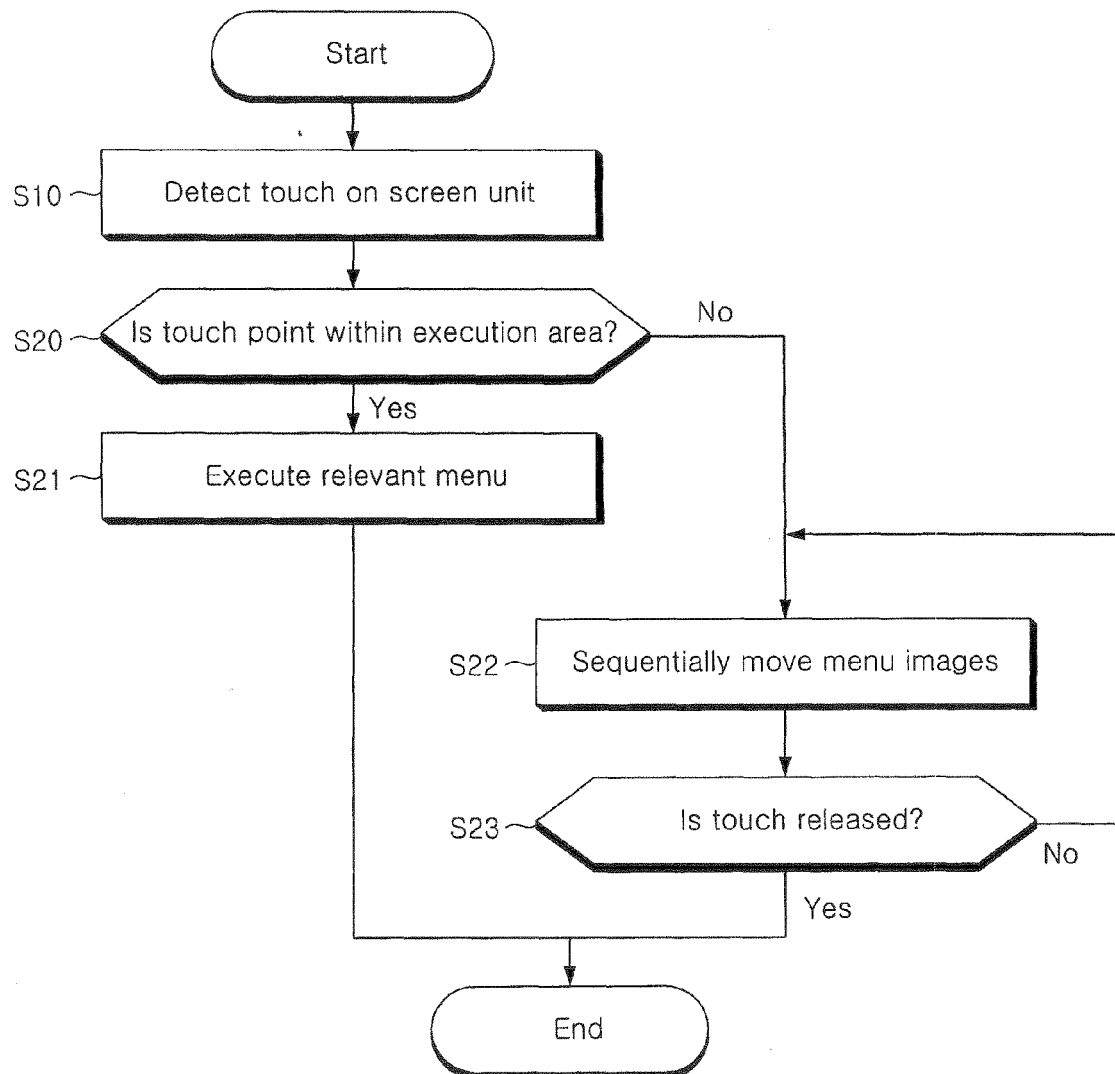


FIG. 4A

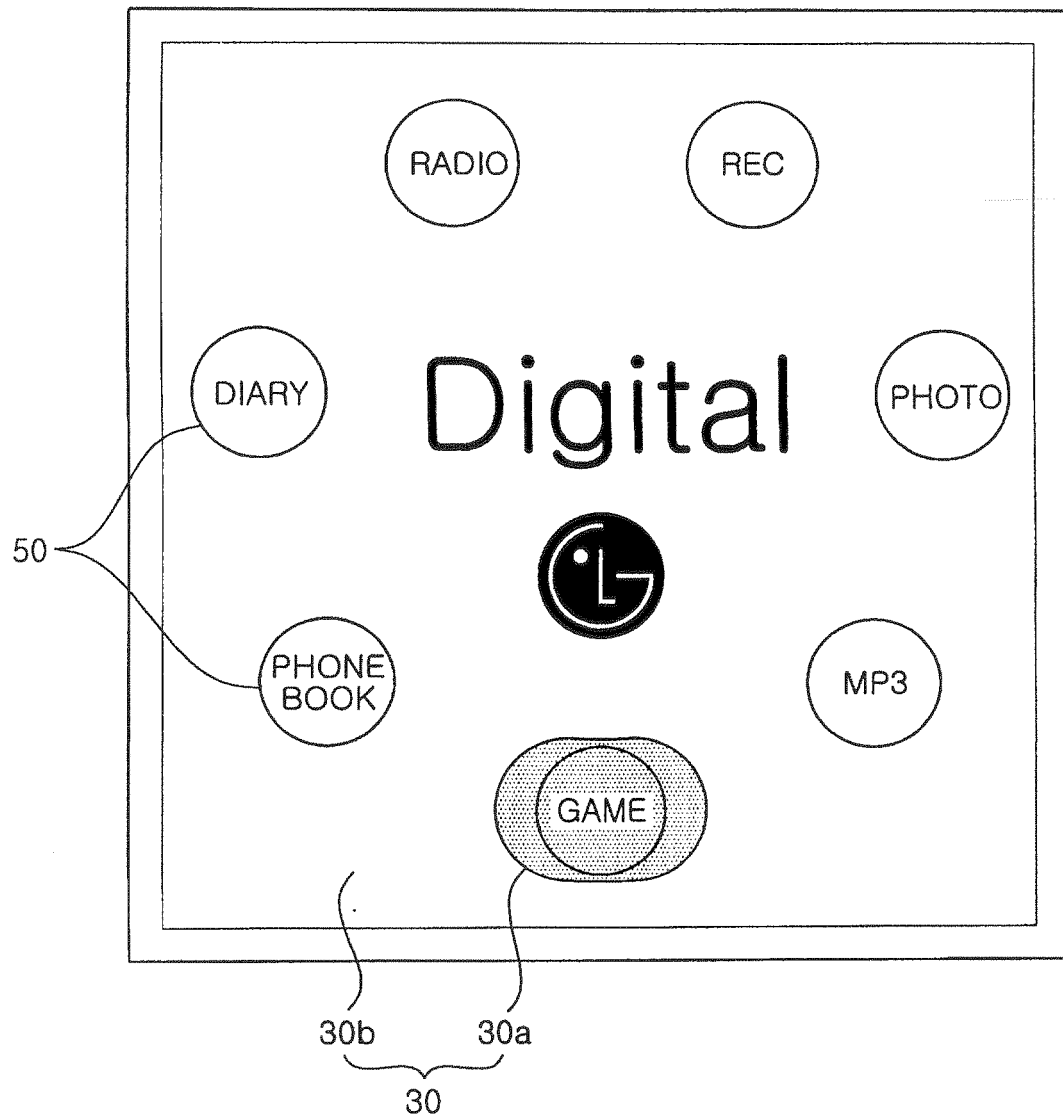


FIG. 4B

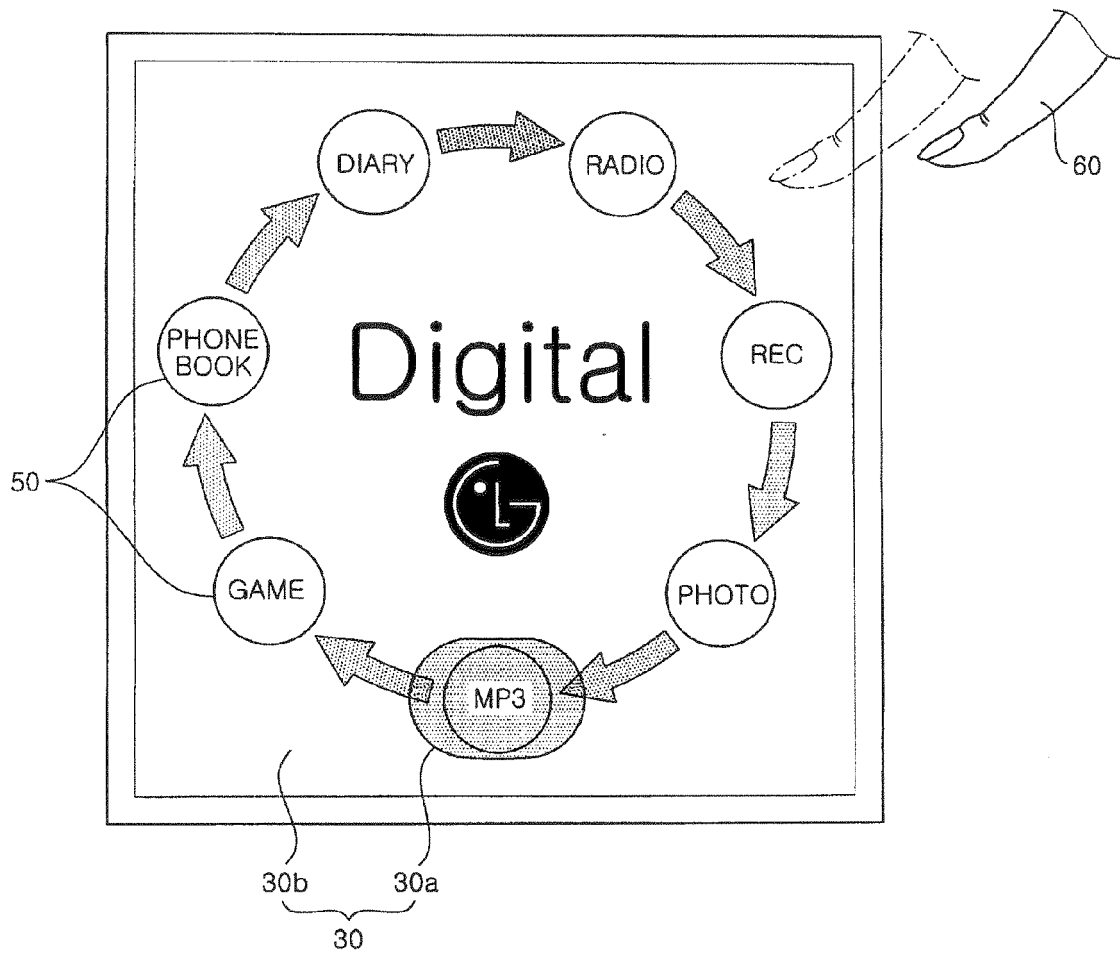


FIG. 4C

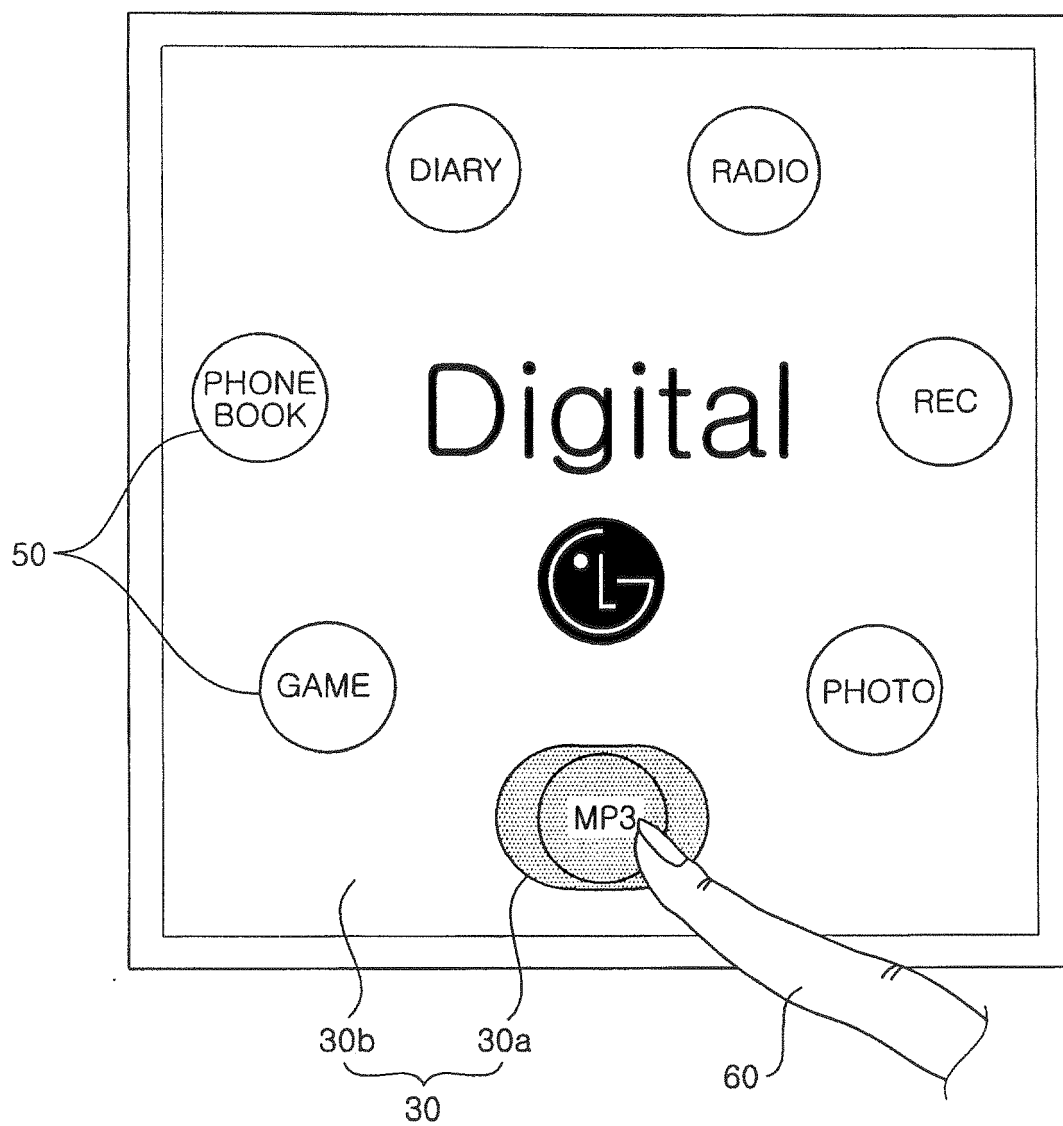


FIG. 5

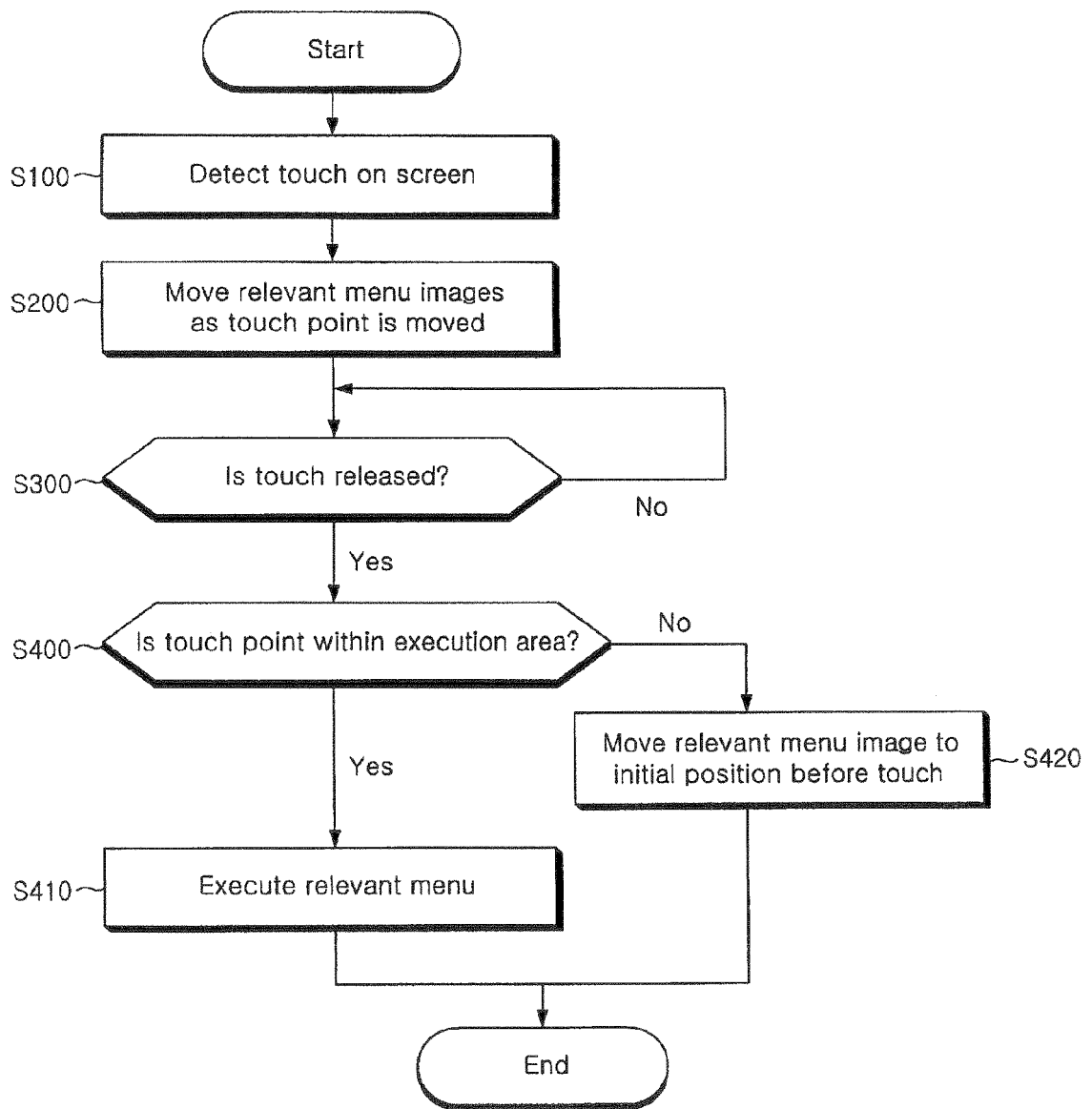


FIG. 6A

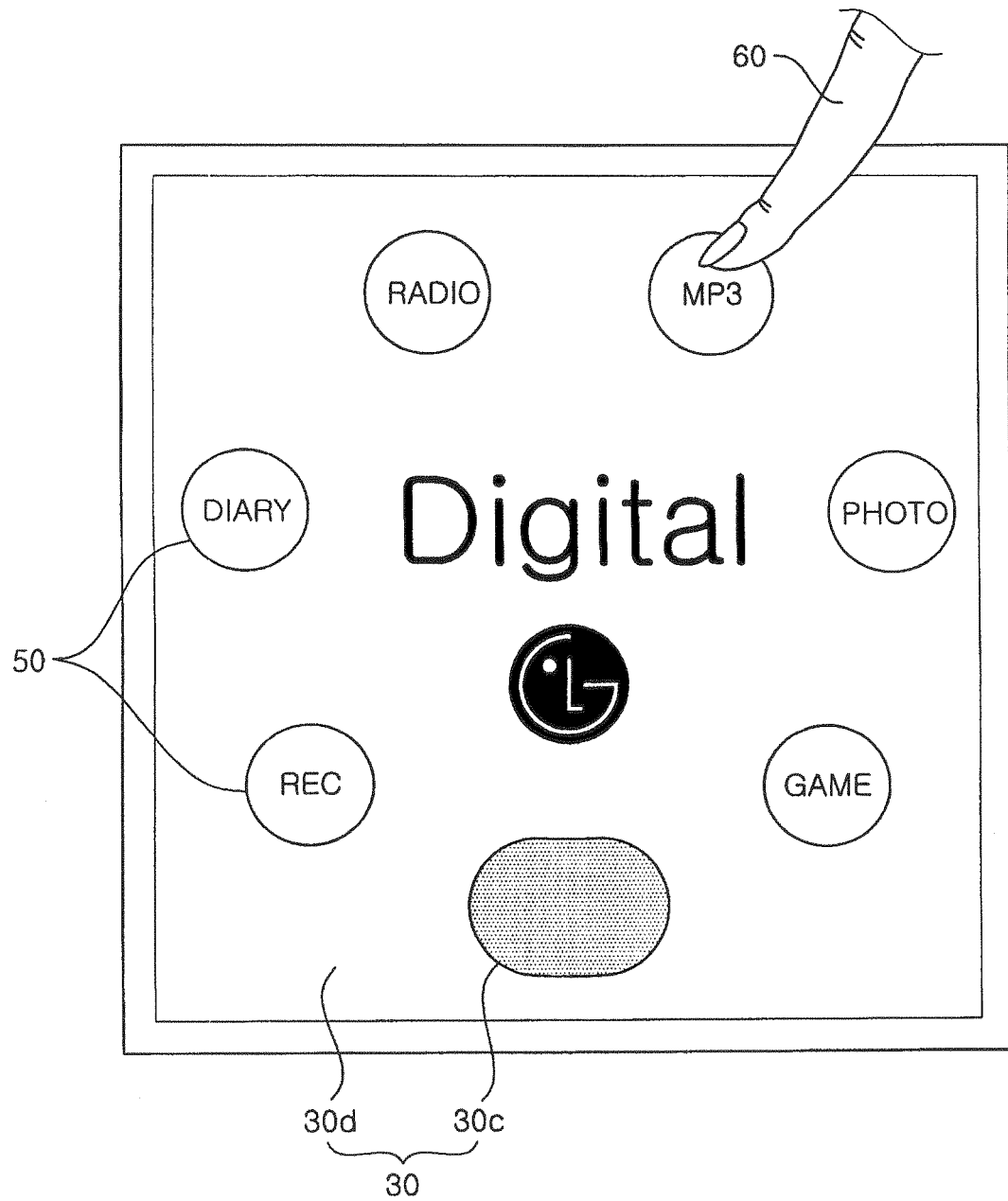


FIG. 6B

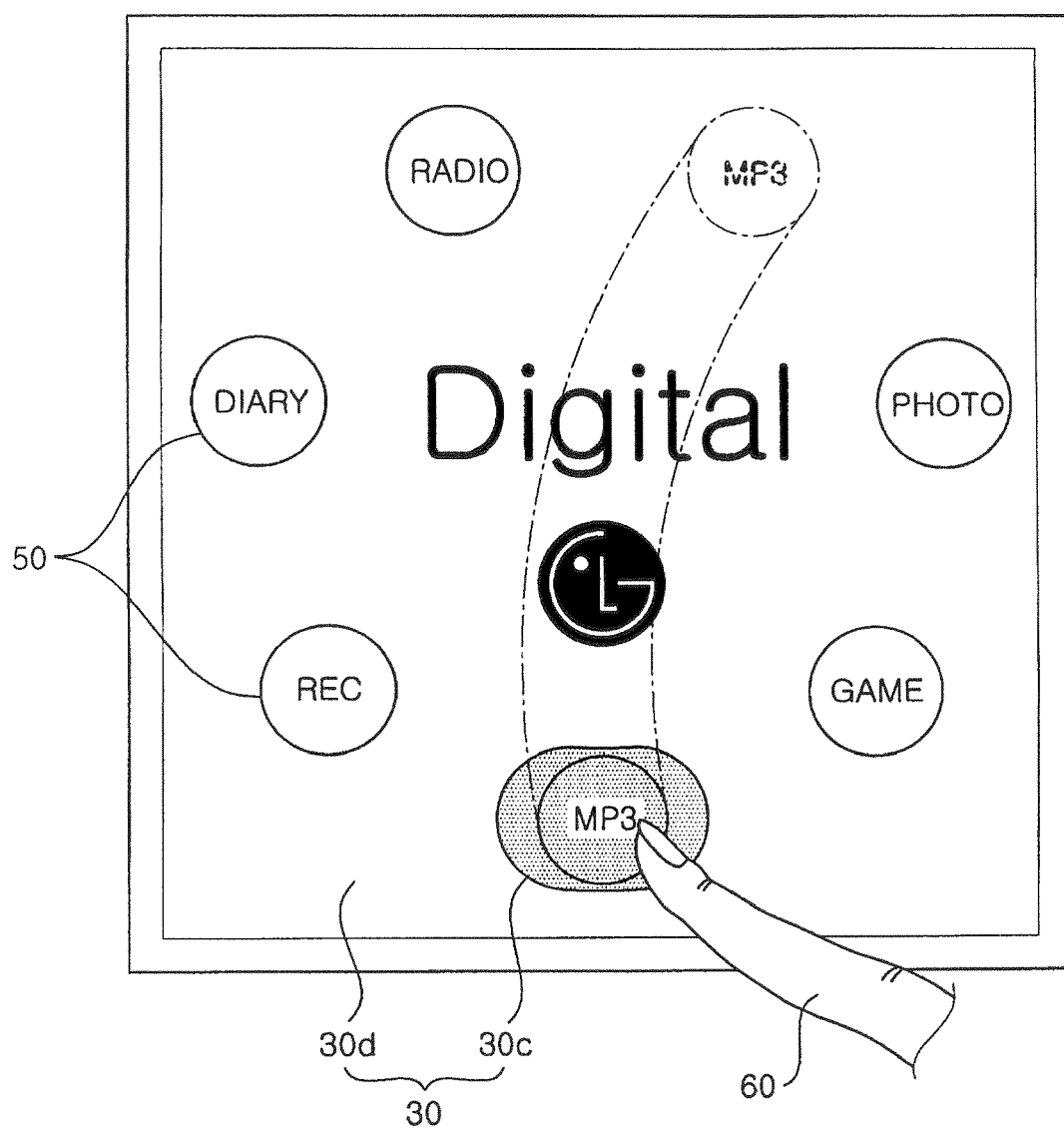


FIG. 6C

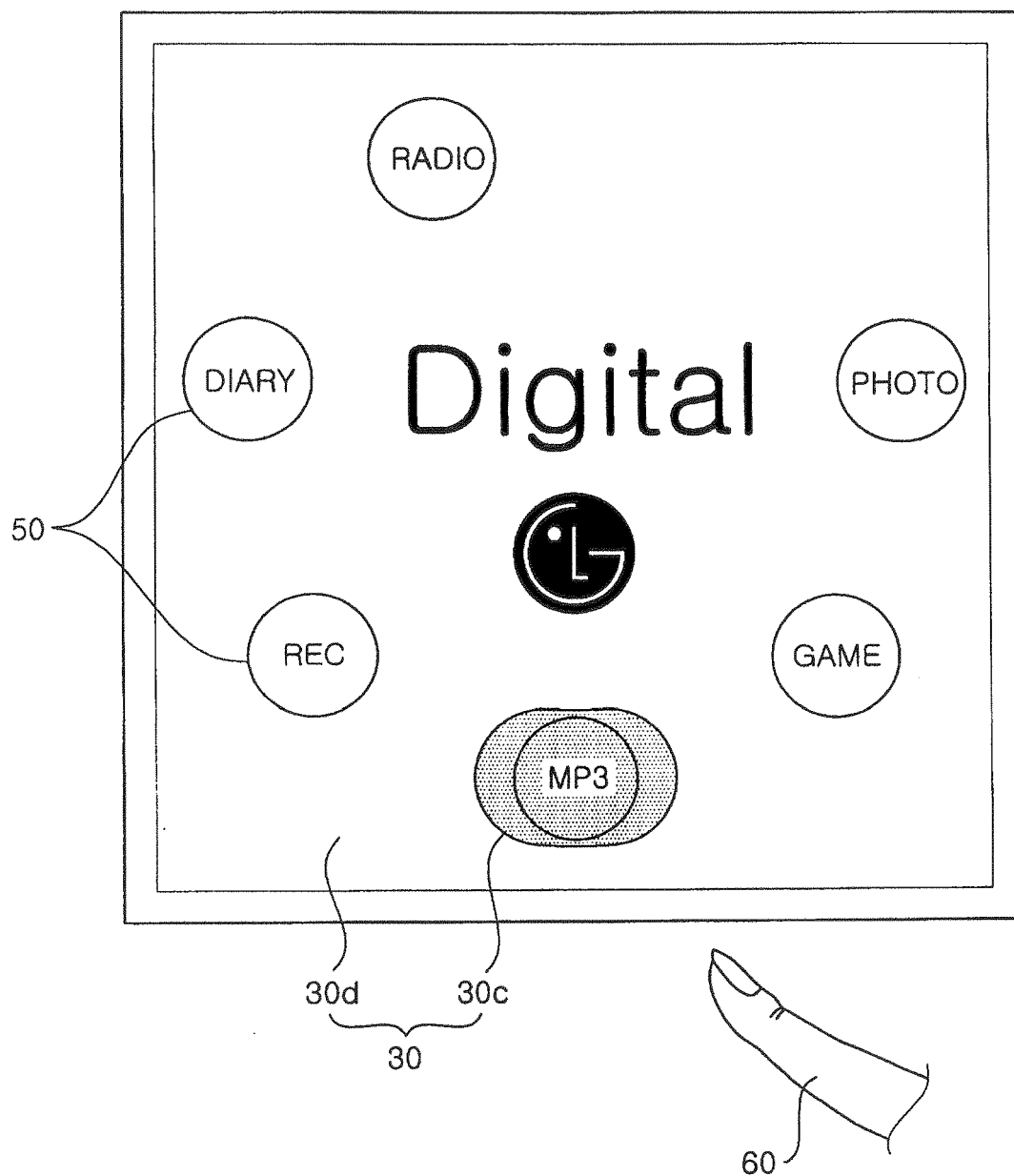


FIG. 6D

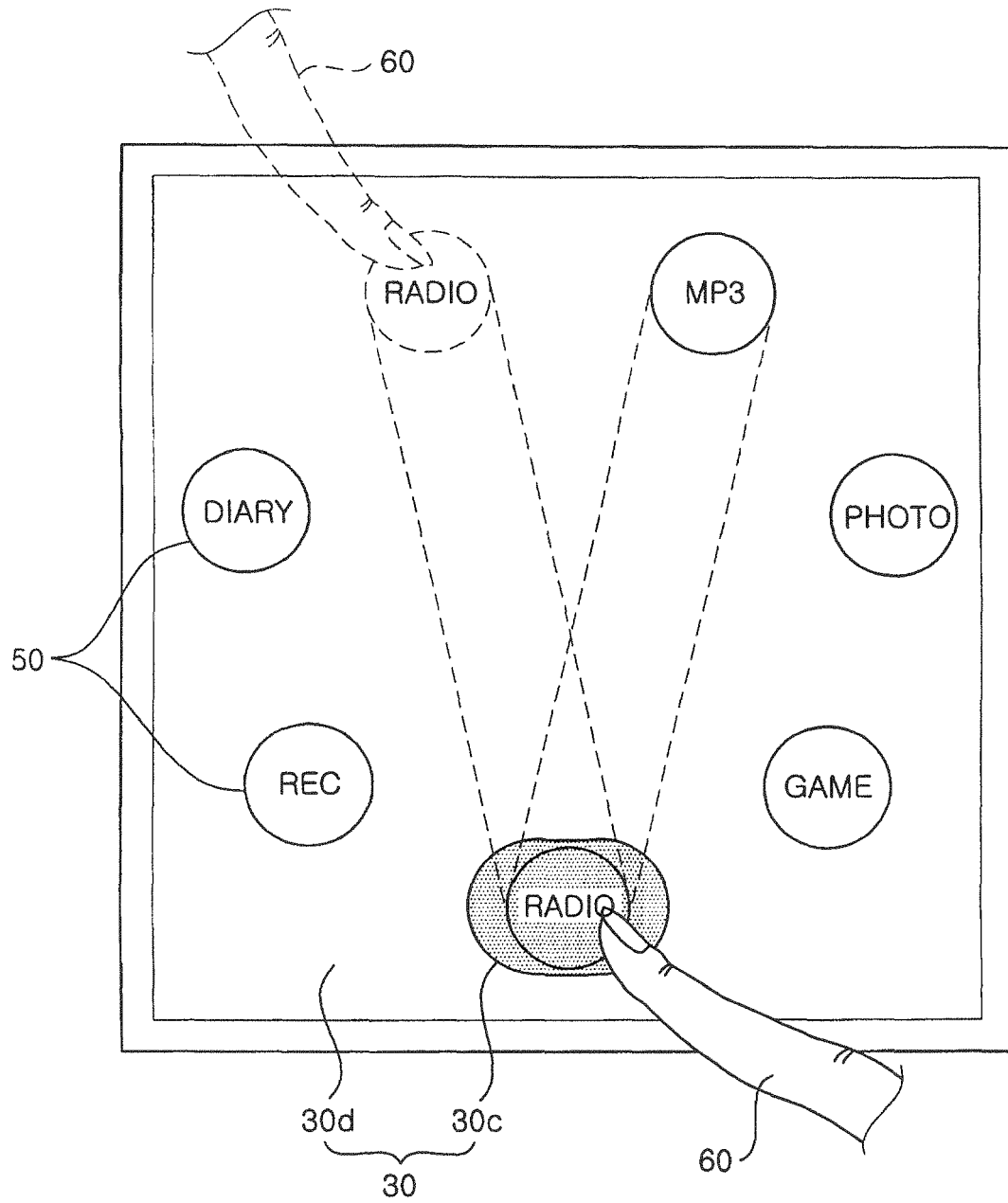


FIG. 7

